US EPA Approval Signature

Date
November 28, 2003
Revised: December 26, 2003

Ms. Christine Clark
Regional Sample Control Custodian
Office of Environmental Measurement and Evaluation
U.S. EPA Region I
11 Technology Drive
North Chelmsford, MA 01863

Re: TO No. 17, Task No. 2, TDF No. 1076
Case No. Connecticut River Fish Study - Co-planar PCBs
Environmental Research Institute - Storrs, CT.
Connecticut River

Co-Planar PCB Congeners: 15/Fish Tissue/CT3-SB-FI01, CT3-SB-FI02, CT3-SB-FI03, CT3-SB-FI04,CT3-SB-OI01, CT5-YP-OC01, CT5-YP-OC02, CT5-YP-OC03, CT5-YP-OC04, CT5-YP-OC05, CT6-SMB-FC01, CT6-SMB-FC02, CT6-SMB-FC03, CT6-SMB-FC04, CT6-SMB-FC05

Dear Ms. Clark:

A modified Tier II data validation was performed on the co-planar PCB congeners analytical data for 15 fish tissue samples collected from the Connecticut River by the following state agencies: CTDEP, MADEP, NHDES with USFWS, and VTDEC for NEIWPCC and the U.S. EPA. The samples were prepared by the U.S. EPA's New England Regional Laboratory and sent to the Environmental Research Institute of the University of Connecticut in Storrs, CT. The samples were analyzed according to the NOAA Technical Memorandum NOS ORCA 130 (modified method), March 1998 and criteria in the Connecticut River Fish Tissue Study Quality Assurance Project Plan (QAPP), April 6, 2000. The samples were validated using first the criteria in the Connecticut River QAPP referenced above, as well as additional criteria in NOAA Technical Memorandum NOS ORCA 130 (modified method), March 1998, defaulting next to Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, December 1996 criteria, and finally to EPA Region I's Environmental Services Assistance Team Toxic PCB and Total Homologue Data Validation SOP ESAT-01-0008 Draft (12/20/02). The data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- * Preservation and Technical Holding Times
- **NR** PE Samples/Accuracy Check
- * Initial and Continuing Calibrations

| | | |
|---|---|---|
| * | ● | Chromatographic Resolution |
| * | ● | Blanks |
| **NR** | ● | Matrix Spike/Matrix Spike Duplicate |
| **NR** | ● | Laboratory and Field Duplicates |
| | ● | Surrogate Standards |
| * | ● | Sample Analysis and Identification |
| | ● | Sample Quantitation |
| | ● | 2378-TCDD Toxicity Equivalents (TE) and Isomer Specificity |
| * | ● | Required Sample Reruns |
| | ● | System Performance |

* - All criteria were met for this parameter.
NR - Not Reported by the Laboratory, but were required in the QAPP.

**The following information was used to generate the Data Validation Memorandum attachments:**

Table I: Recommendation Summary Table - summarizes validation recommendations

Table II: Overall Evaluation of Data - summarizes site objectives and potential usability issues

Data Summary Tables - summarize accepted, qualified, and rejected data

**Overall Evaluation of Data and Potential Usability Issues**

The following is a summary of the site investigation/assessment objectives:

- To perform a watershed-wide fish tissue monitoring program which will document current conditions with regard to contaminant concentrations of representative fish species from the mainstem of the Connecticut River. This information will enable states to revise human health risk assessments and will provide a basis for trend analysis when subsequent sampling is performed by monitoring teams.

The laboratory did not analyze a SRM, MS/MSD, or a duplicate sample, the accuracy and precision of the results could not conclusively be demonstrated. Therefore, all the results are estimated (J). The reported results are usable for screening purposes only. Screening data can be thought of as a qualitative indication of the presence of the analytes of concern. Screening data gives an indication of where future work needs to be directed.

The initial and continuing calibrations were run at the proper intervals and met method criteria.

**Data Completeness**

The laboratory submitted the results for all the co-planar PCB analyses in a report entitled "Data Report - Connecticut River Fish Tissue Study" March 30, 2001. They also supplied the Quantitation Reports, chromatograms, and surrogate recoveries for the fifteen tissue samples in this validation. The co-planar congeners requiring manual integration were marked with an "M" on the Quantitation Reports. However, the laboratory did not provide example chromatograms

showing how the manual integrations were performed.

The following discrepancies and/or missing information were noted in the material supplied by the laboratory:

1. The laboratory was asked to submit the final Form Is for all of the co-planer PCBs and associated blanks. The following information is needed on the Form Is:

   - Extraction and analysis date(s)
   - Sample wet weight
   - GPC TED factor
   - Volume taken
   - Total volume
   - Dilution factors

2. The laboratory was asked to submit the % lipids for samples CT3-SB-OI01 and CT5-YP-OC01.

3. The laboratory was asked to submit the surrogate % recoveries.

Items 1 thru 3 were requested via the TOPO in August 2003 and were received via the TOPO in September, October, and November 2003. All items are adequately addressed except for item 2.

For item 2, the laboratory was unable to locate the % lipids results for sample CT5-YP-OC01.

**Surrogate Standards**

The following table summarizes the surrogate standards with recoveries which do not meet the acceptance criterion of 30-130% specified in Connecticut River Fish Tissue Study Quality Assurance Project Plan (QAPP), April 6, 2000:

| Surrogate Standard | % Recovery | Action | | Affected Samples |
|---|---|---|---|---|
| | | Positive Detects | NDs | |
| OCN | 138 | J | UJ | CT5 YP OC04 |
| OCN | 137 | J | UJ | CT6 SMB FC01 |
| OCN | 138 | J | UJ | CT6 SMB FC02 |
| OCN | 162 | J | UJ | CT6 SMB FC05 |

OCN - Octachloronaphthalene

The corresponding non-labeled congeners are estimated as shown in the table because surrogate

standard recoveries are outside criterion.

**Sample Quantitation**

The laboratory originally reported concentrations for positive detects with a percent difference less than 25% between the two analytical columns with concentrations higher than the 10 ng/ml (in solution) method detection limit. However, the laboratory did not use this criterion consistently when reporting the results. The validator used professional judgement to report concentrations for positive detects with a percent difference less than 100% between the two analytical columns with concentrations higher than the 10 ng/ml (in solution) method detection limit.

The laboratory did achieve the Project Quantitation Limits of 2 ug/Kg.

The sample extracts were concentrated to a volume of 0.25 ml instead of 1.0 ml. The laboratory did not take into consideration the resulting dilution factor of 4. Therefore, the reported values were four times higher than actual. The data validator corrected the reported values for the factor of four. The laboratory corrected their copy of the reported results.

**2378-TCDD Toxicity Equivalents (TE) and Isomer Specificity**

All TE values reported on the Data Summary Tables have been calculated by the ESAT data validator using the validated data discussed above in this report. As a result, the TE values in the Data Summary Table differ slightly from the values reported by the laboratory. The Fish TEF values used by ESAT are the ones published in Environmental Health Perspectives, volume 106, Number 12, December 1998, "Toxic Equivalency factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife."

**System Performance**

The laboratory did not analyze a SRM, MS/MSD, or a duplicate sample, the accuracy and precision of the results could not conclusively be demonstrated. Therefore, all the results are estimated (J). The reported results are usable for screening purposes only. Screening data can be thought of as a qualitative indication of the presence of the analytes of concern. Screening data gives an indication of where future work needs to be directed.

Very truly yours,

LOCKHEED ENVIRONMENTAL

Janine Bartels
Principal Scientist

Louis Macri
ESAT Program Manager

cc: Peter Nolan, EPA Project Manager (DV Memorandum, Data Summary Table)

Attachments: Table I: Recommendation Summary Table
Table II: Overall Evaluation of Data
Data Summary Tables
Data Validation Worksheets
QAPP
Analytical Method
Communication/Phone Logs
Raw Data

Table I
Recommendation Summary Table for Co-Planar PCB Congeners
Connecticut River Site
Case No.: Connecticut River Fish Study/SDG No. Co-planar PCBs

| Sample Nos. | CT3-SB-FI01 | CT3-SB-FI02 | CT3-SB-FI03 | CT3-SB-FI04 | CT3-SB-OI01 | CT5-YP-OC01 | CT5-YP-0C02 | CT5-YP-OC03 |
|---|---|---|---|---|---|---|---|---|
| Compound | | | | | | | | |
| 33'44'-TetraCB (#77) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 344'5-TetraCB (#81) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 2'344'5-PentaCB (#123) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 23'44'5-PentaCB (#118) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 2344'5-PentaCB (#114) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 233'44'-PentaCB (#105) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 33'44'5-PentaCB (#126) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 23'44'55'-HexaCB (#167) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 233'44'5-HexaCB (#156) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 233'44'5'-HexaCB (#157) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 33'44'55'-HexaCB (#169) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |
| 233'44'55'-HeptaCB (#189) | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] | J[1] |

Table I
Recommendation Summary Table for Co-Planar PCB Congeners
Connecticut River Site
Case No.: Connecticut River Fish Study/SDG No. Co-planar PCBs

| Sample Nos. | CT5-YP-OC04 | CT5-YP-OC05 | CT6-SMB-FC01 | CT6-SMB-FC02 | CT6-SMB-FC03 | CT6-SMB-FC04 | CT6-SMB-FC05 |
|---|---|---|---|---|---|---|---|
| Compound | | | | | | | |
| 33'44'-TetraCB (#77) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |
| 344'5-TetraCB (#81) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |
| 2'344'5-PentaCB (#123) | J[1,2] | J[1] | J[1,2] | J[1,2]J | [1] | J[1] | J[1,2] |
| 23'44'5-PentaCB (#118) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |
| 2344'5-PentaCB (#114) | J[1,2] | J[1] | J[1,2] | J[1,2]J | [1] | J[1] | J[1,2] |
| 233'44'-PentaCB (#105) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |
| 33'44'5-PentaCB (#126) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |
| 23'44'55'-HexaCB (#167) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |
| 233'44'5-HexaCB (#156) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |
| 233'44'5'-HexaCB (#157) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |
| 33'44'55'-HexaCB (#169) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |
| 233'44'55'-HeptaCB (#189) | J[1,2] | J[1] | J[1,2] | J[1,2] | J[1] | J[1] | J[1,2] |

Table I
Recommendation Summary Table for Co-Planar PCB Congeners

| | | |
|---|---|---|
| A | - | Accept all results. |
| J[1] | - | Precision and accuracy was not demonstrated; J detects, UJ non-detects. |
| J[2] | - | Surrogate recoveries are outside criterion; J detects, UJ non-detects. |

EPA-NE - Data Validation Worksheet

**Overall Evaluation of Data - Data Validation Memorandum - Table II**

| Co-PLANAR PCB ANALYSIS | | | | | |
|---|---|---|---|---|---|
| DQO (list all DQOs) | Sampling and/or Analytical Method Appropriate Yes or No | Measurement Error | | Sampling Variability | Potential Usability Issues |
| | | Analytical Error | Sampling Error* | | |
| To perform a watershed-wide fish tissue monitoring program which will document current conditions with regard to contaminant concentrations of representative fish species from the mainstem of the Connecticut River. This information will enable states to revise human health risk assessments and will provide a basis for trend analysis when subsequent sampling is performed by monitoring teams. | Yes, Sampling Method appropriate for all samples<br><br>Yes, Analytical Method appropriate for all samples. | Refer to qualification in R/S Key on Table I:<br><br>$J^{1,2}$ | Refer to qualification in R/S Key on Table I:<br><br>NA | ** | The laboratory did not analyze a SRM, MS/MSD, or a duplicate sample, the accuracy and precision of the results could not conclusively be demonstrated. Therefore, all the results are estimated (J). The reported results are usable for screening purposes only. Screening data can be thought of as a qualitative indication of the presence of the analytes of concern. Screening data gives an indication of where future work needs to be directed. |

* The evaluation of "sampling error" cannot be completely assessed in the data validation.

** Sampling variability is not assessed in data validation.

NA Not Applicable

Validator:_____ Date:_____